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Patent
PD-201006A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of:

Donald C. D. Chang

Serial No. 09/858,387 Group Art Unit: 2617

Filed: May 15, 2001 Examiner: Torres, Marcos L.

For: COMMUNICATION SYSTEM FOR MOBILE USERS USING ADAPTIVE ANTENNAS

BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

The following Appeal Brief is submitted in response to the Notice of Appeal filed January 17, 2007.

I. Real Party in Interest

The real party in interest in this matter is The DIRECTV Group, Inc., of El Segundo, California which is 34 percent owned by Fox Entertainment Group, which is approximately 82 percent owned by The News Corporation, Limited.

II. Related Appeals and Interferences

There are no other known appeals or interferences which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of the Claims

Claims 1, 3-22 are pending in the application. Claim 2 has been cancelled. Claim 7 was not rejected in the Final Office Action. Therefore, it is presumed to be allowable.

IV. Status of Amendments

There have been no amendments filed subsequent to the response to the Final Office Action of September 16, 2006.

V. Summary of Claimed Subject Matter

Claim 1 is directed to a communication system that is generally illustrated in Figure 1 for communicating with mobile user terminal 16M. The system is generally described on page 5, lines 3-14.

The communication system includes a base station 18 described on page 5, line 26 through page 6, line 15 having an adaptive antenna 30 that is generally described on page 6, lines 1-5 and is illustrated in Figure 1. The adaptive antenna 30 has a plurality of panels 52 that are illustrated in Figures 2A-2D and is described on page 6, line 22 through page 9, line 23. Each of the panels 52 have a plurality of main array elements 56 or 222 of Figure 13 which are described on page 19, lines 8-25. The main array elements 56 simultaneously generate a plurality of dynamic communication beams that move with the mobile terminals. This is generally described on page 6, line 22 through page 7, line 7.

The communication system 10 further includes a gateway station 20 that is described on page 6, lines 6-10 and page 6, lines 16-21. This is also illustrated in Figure 1. The gateway station 20 is coupled to a base station 18. The gateway station 20 forms a plurality of beam commands for each of the plurality of panels by communicating the plurality of

control signals to the base station to form the plurality of dynamic communication beams. This is generally illustrated in Figures 8 and 13 and is described on page 12, line 18 through page 13, line 2 and page 20, lines 5-6.

Claim 3 depends on claim 1 and is generally illustrated in Figure 13. Claim 3 recites that the base station comprises a plurality of auxiliary elements 224 for cancelling interference between the plurality of dynamic communication beams. This is described on page 19, line 8 through page 20, line 9.

Claim 4 depends from claim 3 and recites that the plurality of auxiliary elements are weighted to provide interference cancelling. This is also illustrated in Figure 3 and is described on page 19, lines 21-25.

Claim 5 depends from claim 1 and recites that the gateway station 20 is RF coupled to the base station. This is described on page 6, lines 1-5.

Claim 6 depends from claim 1 and recites that the base station is wireless. This is described on page 6, line 4.

Claim 7 depends from claim 1 and recites that the gateway station 20 is positioned on the stratospheric platform. This is described on page 21, line 21.

Claim 8 depends from claim 1 and recites that the adaptive antenna 30 comprises a phased array antenna. This is described on page 7, lines 15-19.

Claim 9 depends from claim 1 and recites that the main array elements are modular. This is illustrated in Figure 3 and is described on page 9, line 24 through page 10, line 2.

Claim 10 depends from claim 1 and recites that the main array antenna elements comprise a plurality of modules coupled to a bus. This is illustrated in Figure 3 and is described on page 9, line 24 through page 10, line 2. The bus is illustrated as reference numeral 60.

Claim 11 depends from claim 8 and recites that the bus 60 is coupled to a controller 68. This is also illustrated in Figure 3 and is described on page 9, line 24 through page 10, line 2.

Claim 12 depends from claim 1 and recites that the plurality of user terminals receives the plurality of dynamic communication beams. This is illustrated in Figure 1 and is described in on page 5, line 5-14.

Claim 13 depends from claim 1 and further comprises a limiter 176 coupled within a feedback path. This is illustrated in Figure 11 and is described on page 15, lines 22-24.

Claim 14 depends from claim 1 and recites a nulling processor. This is illustrated in Figure 13 and is described on page 19, lines 8-25.

Claim 15 depends from claim 14 and recites that the nulling processor comprises an element code despread 114 and a user code despread 120.

Claim 16 depends from claim 15 and recites that the nulling processor comprises a weighted feedback look coupled to an output signal. This is described on page 19, lines 8-25.

Claim 17 depends from claim 15 and recites that the nulling processor comprises auxiliary elements coupled to an output signal. The auxiliary elements are illustrated as reference numeral 224 and are described on page 19, line 8 through page 20, line 9.

Claim 18 depends from claim 1 and recites that the base station 18 comprises a plurality of summing blocks 90 coupled to the main array element 74 for generating a sum signal. This is illustrated in Figure 7 and is described on page 12, lines 9-17. Claim 18 further recites that the gateway station 20 comprises an analog-to-digital converter 106 coupled to a noise injection circuit and the sum signal. The sum signal is coupled to a demultiplexer 108 and a digital beam forming circuit. The elements of the gateway station described above are illustrated in Figure 8 and are described on page 12, line 18 through page 13, line 2.

Claim 19 depends from claim 1 and recites that the base station comprises a user code despreading circuit 114 coupled to an element code despreading circuit 120 which is coupled to the main array elements 56 or 222. This is illustrated in Figure 9 and is described on page 13, line 10 through page 14, line 7.

Claim 20 is an independent claim that includes a plurality of wireless base stations 18 described on page 5, line 26 through page 6, line 15. The base stations have adaptive antennas 30 each having a plurality of panels 52 that are illustrated in Figures 2A-2D and are described on page 6, line 22 through page 9, line 23. Each panel 52 has a plurality of main array elements 56 or 222 of Figure 13. The main array elements are also described on page 19, lines 8-25. Each panel simultaneously generates a plurality of dynamic communication

beams that move with the mobile terminals. This is described on page 6, line 22 through page 7, line 7.

Claim 20 also includes a gateway station 20 coupled to the plurality of wireless base stations through a plurality of multiple dynamic links. The gateway station forms a plurality of beams for each of the plurality of panels by communicating a plurality of control signals to the base station from the plurality of dynamic communication beams so that a user receives a first link from a first base station of the plurality of wireless base stations in a second link from the second base station of the plurality of wireless base stations. This is generally shown in Figures 8 and 13 and is described on page 12, line 18 through page 13, line 2. This is also described on page 20, lines 5-6.

Claim 21 is an independent claim that is directed to a method of operating a communication system having a gateway station 20 coupled to a plurality of mobile terminals 16M in a plurality of base stations 18. The method includes that the gateway station 20 dividing a communication signal into a control signal corresponding to a plurality of elements of a plurality of panels 52 of a plurality of adaptive antennas 30 of the plurality of base stations 18. The control signals correspond to a plurality of multiple dynamic links. The base station is illustrated in Figure 1 and is described on page 5, line 26 through page 6, line 15. The adaptive antennas are illustrated as reference numeral 30 in Figure 1 and are described on page 6, lines 1-5. The plurality of panels are illustrated as reference numeral 52 in Figures 2A-2B and are described on page 6, line 22 through page 9, line 23.

Claim 21 further recites the step of directing the control signals to the plurality of base stations 18. This is described on page 20, lines 5-6.

Claim 21 further recites generating multiple dynamic links from the plurality of panels of the plurality of base stations so that more than one dynamic link is generated simultaneously from one panel that moves with the mobile terminals. This is described on page 7, line 13-20.

Claim 22 depends from claim 21 and recites the further step of cancelling interference between the multiple dynamic links. This is illustrated in Figure 13 and is described on page 19, lines 21-25.

VI. Grounds of Rejection to be Reviewed on Appeal

The following issues are presented in this appeal:

Whether Claims 1, 5-6, 8, and 11-12 are unpatentable under 35 U.S.C. §103(a) over *Gross* (6,507,739) in view of *Ward* (6,167,286) in further view of *Denney* (5,995,062) and *Turcotte* (5,856,804).

Whether Claims 20 and 21 are unpatentable under 35 U.S.C. §103(a) over *Gross* in view of *Ward* and *Turcotte* in further view of *Keskitalo* (5,345,448).

Whether Claims 3 and 4 are unpatentable under 35 U.S.C. §103(a) over *Gross* in view of *Ward* and *Turcotte* in further view of *Denney* as applied to claims 1, 5-6, 8, and 11-12, and in further view of *Gutleber* (4,500,883).

Whether Claims 9 and 10 are unpatentable under 35 U.S.C. §103(a) over *Gross* in view of *Ward* and *Turcotte* in further view of *Denney* as applied to claims 1, 5-6, 8, and 11-12, and in further view of *Murray*.

Whether Claim 13 is unpatentable under 35 U.S.C. §103(a) over *Gross* in view of *Ward* and *Turcotte* in further view of *Denney* as applied to claims 1, 5-6, 8, and 11-12, and in further view of *Kasperkovitz*.

Whether Claims 14-17 and 19 are unpatentable under 35 U.S.C. §103(a) over *Gross* in view of *Ward* and *Turcotte* in further view of *Denney* as applied to Claims 1, 5-6, 8, and 11-12, and in further view of *Agee*.

Whether Claim 18 is unpatentable under 35 U.S.C. §103(a) over *Gross* in view of *Ward* and *Turcotte* in further view of *Denney* as applied to Claims 1, 5-6, 8, and 11-12, and in further view of *Park* in further view of *Janc* and in further view of *Sayegh*.

Whether Claim 22 is unpatentable under 35 U.S.C. §103(a) over *Gross* in view of *Ward* and *Turcotte* in further view of *Keskitalo* (5,345,448) in further view of *Gutleber*.

VII. Argument

The rejection of Claims 1, 5-6, 8, and 11-12 under 35 U.S.C. §103(a) over *Gross* (6,507,739) in view of *Ward* (6,167,286) in further view of *Denney* (5,995,062) and *Turcotte* (5,856,804).

Claim1

Claim 1 includes a communication system that has an antenna that has a plurality of panels; each of the panels has a plurality of main array elements for simultaneously generating a plurality of dynamic communication beams. That is, each of the panels may simultaneously generate more than one beam. The beams may also be dynamic

communication beams. The dynamic communication beams as described in the specification in paragraph 44 may track individual subscribers. This highlights the fact that the present invention does not provide a fixed cell pattern. Rather, each beam is associated with a user and, therefore, as the user moves, the beam and therefore the elements associated with the beam are changed so that the user is tracked. Although not claimed in Claim 1, when interference occurs the communication resources associated with the beam may be changed. Claim 1 also recites that the gateway station generates a plurality of beam commands for each of the panels so that the communication beams at the panels may be formed.

The *Gross* reference teaches a system that includes aircraft radio terminals 220 that generate beams. However, no teaching or suggestion is provided for base stations that have an adaptive antenna with a plurality of panels, each panel having a plurality of reconfigurable main array elements for generating a plurality of communication beams as recited in Claim 1.

The *Ward* reference in Col. 10, line 66 through Col. 11, line 27, teaches a "multi-element main array antenna." No teaching or suggestion is provided having a base station with an adaptive antenna with a plurality of panels, each panel having a plurality of reconfigurable main array elements. The Examiner agrees with the Applicants' position in the Office Action, which states that, "Ward does not specifically disclose a communication system wherein the adaptive antenna comprises a plurality of panels."

The *Denney* reference is set forth by the Examiner for an adaptive antenna that has a plurality of panels. The *Denney* reference does illustrate a phased array antenna having a plurality of panels. The multiple panels are illustrated in Fig. 2. The *Denney* reference, however, does not provide simultaneous dynamic beams. The *Denney* reference appears to teach a switch 82 that is used to select a single beam from a single panel. Col. 6, lines 64-67, state that, "... multiple beams using multiple panels simultaneously by controlling the 8-way switches ..." may be performed. The reference further states that, "... it is not anticipated that the antenna would be used in this fashion." Col. 3, lines 63-67, recite that, "Only one panel requires calibration because the 8-way switch, radio frequency cables, and antenna elements are phase matched. This reduces the calibration time by 1/8 and reduces any required memory storage in a controller by 1/8." Thus, the *Denney* reference appears to teach one beam or multiple beams corresponding to a respective panel may be performed.

The *Denney* reference does not teach providing simultaneous beams from the same panel. Also, the *Denney* reference does not teach dynamic beams that move with the user.

The *Turcotte* reference is cited for teaching beams that move with a user. Applicants admit that column 10, lines 6-26, describe beams that track a subscriber unit's movement through the footprint region. However, the *Turcotte* reference does not teach or suggest that the beams are generated from a base station that has an adaptive antenna with a plurality of panels. In fact, it appears that the Examiner is picking and choosing from the now-four references in the rejection to form a hindsight reconstruction of the invention. Applicants respectfully submit that there is no teaching or suggestion in any of the references for making such a broad combination. It is improper to use the inventor's disclosure as an instruction book on how to reconstruct the prior art. *Panduit Corp. v. Dennison Mfg. Co.*, 1 USPQ2d 1593 (Fed. Cir. 1987). Both the suggestion and the expectation of success must be founded in the prior art and not in Applicant's disclosure. In re Farrell, 7 USPQ2d 1673 (Fed. Cir. 1988). In this case, the Examiner has picked and chosen his way through four references to find elements of the claim. Although the elements may exist, the Appellants have combined them in a new and useful manner. Therefore, Applicants respectfully request the Board to reverse the Examiner's rejection of Claim 1.

Claim 5

Claim 5 includes the gateway station being RF coupled to the base station. Appellants respectfully submit that this is not taught or suggested in the references. The *Gross* reference has a base station terminal 206 that appears to be coupled to a base station antenna through a ground base communication link. Therefore, these are not RF coupled. Not surprisingly, the Examiner fails to allege this element exists in any of the references. Appellants, therefore, respectfully request the Board to reverse the Examiner's position with respect to claim 5.

Claim 6

Claim 6 recites that the base station is wireless. This claim stands or falls together with claim 1.

Claim 8

Claim 8 recites that the antenna is a phased array antenna. This claim stands or falls together with claim 1.

Claim 11

Claim 11 recites that a bus is coupled to the controller. The Examiner points to column 4, lines 49-54 for a bus. However, Appellants have reviewed this section and, although computing equipment is taught in the *Gross* reference, no teaching or suggestion is provided for a bus coupled to a controller. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 11.

Claim 12

Claim 12 depends from claim 11 and further recites a plurality of user terminals receiving the plurality of dynamic communication beams. Claim 12 stands or falls together with claim 1. Appellants, therefore, respectfully request the Board to reverse the Examiner's position with respect to claim 20.

The rejection of Claims 20 and 21 under 35 U.S.C. §103(a) over Gross in view of Ward and Turcotte in further view of Keskitalo (5,345,448)

Claim 20

Claim 20 is similar to Claim 1 in that each of the panels may generate more than one dynamic link from a panel. Claim 20 is different in that two links from two different base stations are directed to a user. As mentioned above the *Gross, Ward* and *Turcotte* have several deficiencies.

The *Keskitalo* reference teaches a time division multiple access system. A time division multiple access system typically does not generate simultaneous beams as recited in the first clause of Claim 1. Each beam or resource is inserted in a different time slot. The present invention provides that more than one beam may be generated from more than one panel. The beams are also dynamic in that they move with the user. The *Keskitalo* reference is a handover system for handing over the communication from one base transceiver station to another transceiver station as a mobile station moves. The *Keskitalo* reference does not teach a system that has base stations with a plurality of multiple channels. Thus, the *Keskitalo* reference does not teach or suggest several of the elements and the present claims.

Claim 21

Claim 21 is another independent claim that is directed to a method similar in scope to claim 20. In fact, claim 21 recites "Generating multiple dynamic links from the plurality of panels of the plurality of base stations so that more than one dynamic link is generated

simultaneously from one panel that moves with the mobile terminals." As mentioned above, the *Keskitalo* reference does not teach or suggest simultaneously generating more than one beam from a panel. In fact, the *Keskitalo* reference teaches a way by providing a time division multiple access system. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 21 as well.

The rejection of Claims 3-4 under 35 U.S.C. §103(a) over Gross in view of Ward and Turcotte in further view of Denney as applied to claims 1, 5-6, 8, and 11-12, and in further view of Gutleber

Claim 3

The *Gross*, *Ward* and *Turcotte* references each have drawbacks as recited above. Although adaptive multiple interference tracking and canceling is described with respect to the antenna of the *Gutleber* reference, no teaching or suggestion is provided in the reference for the element missing from Claim 1 as recited above. Also, there is no teaching or suggestion in the *Gutleber* reference for combining the antenna into a system having a gateway station that forms communication commands for each of a plurality of panels. Therefore, Applicants respectfully request the Board to reverse the Examiner's rejection of Claim 3.

Claim 4

Claim 4 depends from claim 3 and recites that the auxiliary elements are weighted to provide interference cancelling. The Examiner takes official notice that weighting signals to provide interference cancelling is common. Appellants respectfully submit that providing weights for interference cancelling using auxiliary elements is not taught or suggested in any of the references. Appellants respectfully submit that the Examiner's use of official notice in this case is improper. The combination of elements from claims 3 and 1 is not taught or suggested in any of the references. Therefore, the official notice in combination with these does not teach combining the references in the manner set forth by claim 4. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 4 as well.

The rejection of Claims 9-10 under 35 U.S.C. §103(a) over Gross in view of Ward and Turcotte in further view of Denney as applied to claims 1, 5-6, 8, and 11-12, and in further view of Murray

Claim 9

Claim 9 recites that the main array elements are modular. Although column 1, lines 4-7 of *Murray* does mention array antennas that are modular, no teaching or suggestion is provided for combining the *Murray* reference with the *Gross, Ward,* and *Denney* references. Appellants, therefore, respectfully request the Board to reverse the Examiner's position with respect to claim 9.

Claim 10

Claim 10 recites that the main array antenna elements comprise a plurality of modules coupled to a bus. As mentioned above, the *Murray* reference teaches modular antenna elements. However, the Examiner then takes official notice that combining a modular element with a bus is well known. Appellants respectfully submit that combining a modular element with a bus is not taught or suggested in any of the references and is also not known in the present combination of art presented by the Examiner. Appellants, therefore, respectfully request the Board to reverse the Examiner's position with respect to claim 10 as well.

The rejection of Claim 13 under 35 U.S.C. §103(a) over Gross in view of Ward and Turcotte in further view of Denney as applied to claims 1, 5-6, 8, and 11-12, and in further view of Kasperkovitz

Claim 13

Claim 13 depends from claim 1 and recites a limiter coupled within a feedback path. As mentioned above, the *Gross, Ward, Turcotte* and *Denney* references have several limitations. The *Kasperkovitz* reference is directed to a phase lock loop for a directly mixing synchronous AM receiver. Claim 13 recites that a limiter is coupled to a feedback path. Applicants agree that a limiter LA is shown in Fig. 1. However, the limiter is not in a feedback path. A feedback path feeds the output of a control system back to an input to the control system. In the final Office Action, the Examiner states that "Regarding Applicant's argument that *Kasperkovitz* does not teach a limiter in a feedback path, claim 13 recites a limiter coupled within a feedback path. Still, Appellants respectfully submit that the limiter must be within the feedback path. Therefore, no teaching or suggestion is provided for a

limiter in a feedback path. Appellants, therefore, respectfully request the Board to reverse the Examiner's position with respect to claim 13.

The rejection of Claims 14-17 and 19 under 35 U.S.C. §103(a) over Gross in view of Ward and Turcotte in further view of Denney as applied to Claims 1, 5-6, 8, and 11-12, and in further view of Agee.

Claim 14

Claim 14 stands or falls together with claim 1.

Claim 15

Claim 15 recites that the nulling processor comprises an element code despread and a user code despread. The Examiner points to column 23, lines 7-29 and column 11, lines 33-48. Claim 15 specifically recites element code despread and user code despread. Although dispreading is mentioned, no teaching or suggestion is provided for element code despread and user code despread as set forth in claim 15. Appellants, therefore, respectfully request the Board to reverse the Examiner's position with respect to claim 15.

Claim 16

Claim 16 depends from claim 15 and recites that a weighted feedback loop is coupled to an output signal. Weighting is also specifically set forth in column 11 of the *Agee* reference. However, the weighting illustrated in Figure 8 as reference numeral 240 does not appear to be within a feedback loop. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 16 as well.

Claim 17

Claim 17 recites that the nulling processor comprises auxiliary elements coupled to an output signal. Appellants can find no teaching or suggestion for auxiliary elements in the *Agee* reference. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 17 as well.

Claim 19

Claim 19 recites that the base station comprises a user code de-spreading circuit coupled to an element code de-spreading circuit which is coupled to the main array elements. As mentioned above with respect to claim 15, there is no teaching or suggestion for user code de-spreading and element code de-spreading. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 19 as well.

The rejection of Claim 18 under 35 U.S.C. §103(a) over Gross in view of Ward and Turcotte in further view of Denney as applied to Claims 1, 5-6, 8, and 11-12, and in further view of Park in further view of Janc and in further view of Sayegh

Claim 18

Although the three additional references provide some of the teachings, each of these references does not provide the elements missing from the *Gross, Ward, Turcotte* and *Denney* references nor the motivation to form the combination. That is, no teaching or suggestion is provided in any of the three references for forming an adaptive antenna with a plurality of panels, each having a plurality of reconfigurable main array elements for generating a plurality of communication beams that are formed by control signals from a gateway station that form beam commands for each of the plurality of panels. Appellants, therefore, respectfully request the Board to reverse the Examiner's position with respect to claim 18 as well.

The rejection of Claim 22 under 35 U.S.C. §103(a) over Gross in view of Ward and Turcotte in further view of Keskitalo (5,345,448) in further view of Gutleber

Claim 22

Claim 22 depends from claim 21 and recites interference cancelling. Although interference cancelling is known, there is no teaching or suggestion for interference cancelling between multiple dynamic links with the limitations set forth in claim 21. In fact, the *Gutleber* reference is used for tracking interference from multiple undesired signal sources. However, there is no teaching or suggestion that these signal sources are multiple dynamic links. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 22 as well.

Conclusion

For the foregoing reasons, Appellants respectfully request that the Board direct the Examiner in charge of this examination to withdraw the rejections.

Please charge any fees required in the filing of this appeal to Deposit Account 50-0383.

Respectfully submitted,

Dated: January 17, 2007

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VIII. Claims Appendix

1. (Previously Presented) A communications system for communicating with mobile user terminals comprising:

a base station having an adaptive antenna with a plurality of panels, each panel having a plurality of main array antenna elements for simultaneously generating a plurality of dynamic communication beams that move with the mobile terminals; and

a gateway station coupled to said base station, said gateway station forming a plurality of beams commands for each of the plurality of panels by communicating a plurality of control signals to the base station to form the plurality of dynamic communication beams.

3. (Previously Presented) A communications system as recited in claim 1 wherein said base station comprises a plurality of auxiliary elements for canceling interference between the plurality of dynamic communication beams.

4. (Previously Presented) A communications system as recited in claim 3 wherein said plurality of auxiliary elements are weighted to provide interference canceling.

5. (Original) A communications system as recited in claim 1 wherein said gateway station is RF coupled to said base station.

6. (Original) A communications system as recited in claim 1 wherein said base station is wireless.

7. (Original) A communications system as recited in claim 1 wherein said gateway station is positioned on a stratospheric platform

8. (Previously Presented) A communications system as recited in claim 1 wherein said adaptive antenna comprises a phased array antenna.

9. (Previously Presented) A communications system as recited in claim 1 wherein said main array antenna elements are a modular.

10. (Previously Presented) A communications system as recited in claim 1 wherein said main array antenna elements comprise a plurality of modules coupled to a bus.

11. (Previously Presented) A communications system as recited in claim 10 wherein said bus is coupled to a controller.

12. (Previously Presented) A communications system as recited in claim 1 further comprising a plurality of user terminals receiving said plurality of dynamic communication beams.

13. (Original) A communications system as recited in claim 1 further comprising a limiter coupled within a feedback path.

14. (Original) A communications system as recited in claim 1 further comprising a nulling processor.

15. (Original) A communications system as recited in claim 14 wherein said nulling processor comprises an element code despread and a user code despread.

16. (Previously Presented) A communications system as recited in claim 15 wherein said nulling processor comprises a weighted feedback loop coupled to an output signal.

17. (Original) A communications system as recited in claim 15 wherein said nulling processor comprises auxiliary elements coupled to an output signal.

18. (Original) A communications system as recited in claim 1 wherein said base station comprises a plurality of summing blocks coupled to said main array element for generating a summed signal, said gateway station comprising an analog-to-digital converter coupled to a noise injection circuit and said summed signal, said summed signal coupled to a demultiplexer and a digital beam forming circuit.

19. (Original) A communication system as recited in claim 1 wherein said base station comprises a user code despreading circuit coupled to an element code despreading circuit which is coupled to said main array elements.

20. (Previously Presented) A communications system for communicating with mobile user terminals comprising:

a plurality of wireless base stations having adaptive antennas each having a plurality of panels, each panel having a plurality of main array antenna elements, each panel simultaneously generating a plurality of dynamic communication beams that move with the mobile terminals;

a gateway station coupled to said plurality of wireless base stations through a plurality of multiple dynamic links, said gateway station forming a plurality of beams for each of the plurality of panels by communicating a plurality of a control signals to the base station to form the plurality of dynamic communication beams so that a user receives at least a first link from a first base station of the plurality of wireless base stations and a second link from a second base station of the plurality of wireless base stations.

21. (Previously Presented) A method of operating a communication system having a gateway station, a plurality of mobile terminals and a plurality base station comprising:

at the gateway station, dividing a communication signal into a control signal corresponding to a plurality of elements of a plurality of panels of a plurality of adaptive antennas of a plurality of base stations, said control signals corresponding to a plurality of multiple dynamic links ;

directing the control signals to the plurality of base stations; and

generating multiple dynamic links from the plurality of panels of the plurality of base stations so that more than one dynamic link is generated simultaneously from one panel that move with the mobile terminals.

22. (Original) A method as recited in claim 21 further comprising canceling interference between said multiple dynamic links.

IX. Evidence Appendix

None.

X. Related Proceedings Appendix

None.